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December 19, 2012

VIA FEDERAL EXPRESS

Peter Briggs, Director
New York State Department of
Environmental Conservation
Division of Mineral Resources
Bureau of Oil & Gas Permitting and Management
625 Broadway, 3rd Floor
Albany, NY 12233-6500

Re: *Arlington Storage Company, LLC; Seneca Lake Storage Facility;
Seneca Gallery 2*

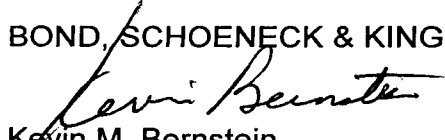
Dear Peter:

In connection with Arlington Storage Company's ("Arlington") application for an Underground Natural Gas Storage Modification Permit for Gallery 2 of the Seneca Lake Natural Gas Storage Facility ("Facility"), attached is Arlington's Response (an original and one copy) to the Department's November 6, 2012 Notice of Incomplete Application ("NOIA"). Included with the Response are Exhibits A-N.

Please note that the information contained in the Response to November 6, 2012 NOIA (including Exhibits B-F, portions of Exhibit G previously determined to be confidential, and Exhibits J-M) contains confidential information or confidential and/or proprietary, trade secret or business information and should be treated as privileged and confidential and should not be released pursuant to the provisions of 6 NYCRR § 616.7.

Sincerely,

BOND, SCHOENECK & KING, PLLC


Kevin M. Bernstein
Enclosures

cc: Linda Collart, NYSDEC (w/enclosure)
Dr. Langhorne Smith, State Geologist (w/enclosure)
Arlington Storage (w/enclosure)

New York State Department of Environmental Conservation

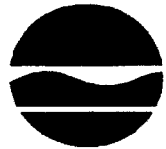
Division of Mineral Resources

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Joe Martens
Commissioner

November 6, 2012

Kevin M. Bernstein, Esq.
Bond, Schoeneck & King, PLLC
One Lincoln Center
Syracuse, NY 13202

**Re: NOTICE OF INCOMPLETE APPLICATION &
STATUS OF MATERIALS
ECL Article 23 Underground Storage Modification Permit
Arlington Storage Company, LLC
Seneca Lake Storage Facility – Gallery 2,
Salt Point Storage Field, Reading, Schuyler County**

Dear Mr. Bernstein:

This is sent to provide you with a Notice of Incomplete Application (“NOIA”) for Arlington Storage Company, LLC’s (“Arlington”) subject application and revised application received by the Department on May 14, 2010 and July 2, 2012, respectively, and Arlington’s Core Analysis Reports received by the Department on October 23, 2012. In addition, the current status of each primary element necessary to complete the application is noted on the enclosure. This NOIA does not address any other Department applications, permits and/or approvals that may be required in conjunction with the subject permit.

The following response is organized in the same fashion as the Department’s listing of application and permitting requirements for the underground storage of gas. The enclosed comments and questions must be addressed to continue processing Arlington’s application for an Underground Storage Modification Permit for its existing natural gas facility. Also enclosed is Receipt No. 572330 for full payment of the modification permit application fee of \$5,000.

Please contact me if you have any comments or questions concerning this NOIA.

Sincerely,

Peter S. Briggs, Director
Bureau of Oil & Gas Permitting and Management

PB/tj
Enclosures

c: B. Cigich (Arlington)
B. Moon (Arlington)
D. Keehn, Esq.
L. Collart
S. Sheeley
L. Smith (NYGS)

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1. **Organizational Report** - *All well owners, operators, drillers and pluggers must file a notarized form with DMN prior to commencing any regulated activity, including preparatory work on the well site. The well owner may authorize other persons to sign all subsequent submittals to the Department by listing them on the Organizational Report form. An updated Organizational Report must be filed with the Department when a change in address or corporate structure occurs.*

Arlington's April 10, 2012 Organization Report must be updated, and a revised Organizational Report filed with the Department due to recent management changes within the company.

2. **Financial Security** – *Adequate financial security is required prior to issuance of any well drilling permit or approval of any well transfer request.*

Satisfactorily addressed. Arlington must continue to maintain adequate financial security for its wells at all times.

3. **Transfer of Well Plugging Responsibilities** - *Approval of such transfer requires properly completed request for transfer forms, followed by compliance inspection of the wells by Regional staff and verification of financial security.*

Satisfactorily addressed. Project records indicate that Well No. 30 was properly transferred and approved on July 12, 2011. Well Nos. 31 and 45 were plugged and abandoned by a previous operator. Following Arlington's acquisition of the Seneca Lake Storage Facility from New York State Electric & Gas Corporation (NYSEG) on July 13, 2011, Arlington properly applied for and received approvals on August 15, 2011 to re-enter Well Nos. 31 and 45, and concurrently filed appropriate financial security, and thus accepted well plugging responsibilities at the time of permit issuance at each well. Arlington re-entered Well Nos. 31 and 45 on October 11, 2011 and September 22, 2011, respectively.

4. **Full Environmental Assessment Form** - *In contrast to the individual Environmental Assessment Form required with each drilling permit application, the Full Environmental Assessment Form ("EAF") is required to address the whole storage project, including any compressor site, any proposed lateral pipelines to power plants or transmission lines, and any proposed discharges. The Full EAF will be used to identify:*

- a. *Any need for additional Department permits including those that address brine handling and discharge/disposal.*

Arlington provided an EAF with its storage application dated July 1, 2010. The following comments must be addressed, and a revised form submitted.

- i. Page 2, Part 1 – The address of the storage facility under "Location of Action" must be revised to include the municipality and county.
 - ii. Page 2, Part 1 – The name provided for "Name of Applicant/Sponsor" does not match the name on the Organizational Report currently on file. The "Name of Applicant/Sponsor"

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must exactly match the revised Organizational Report that will be submitted by Arlington pursuant to the Department's comment under Item 1 above. Please correct this page.

- iii. Page 3, Section A, Question 2 – Arlington states that *meadow or brushland* presently occupies 2.0 acres and will continue to occupy 2.0 acres after completion. Based on Pages 5 and 18 in the May 2012 storage application, it is the Department's understanding that 0.34 acres will be permanently used during operation of the facility. Please clarify if the 0.34 acres is part of the 2.0 acres of *meadow or brushland*. If it is part of the 2.0 acres, and the land type for the 0.34 acres will not consist of *meadow or brushland* after completion of the project, then the approximate *meadow or brushland* acreage after completion of the project needs to be revised accordingly.
 - iv. Page 3, Section A, Question 8 – Depth to the water table at the proposed storage cavern location must be provided. Please provide an estimated depth in feet.
 - v. Page 3, Section A, Question 10 – It is the Department's understanding that "hunting, fishing, or shell fishing" is not an opportunity at the immediate project site. Please revise the response to "No."
 - vi. Page 5, Section B, Question 1.a – Please revise the response to include acreage for the project sponsor only, and do not include acreage for the parent company or its other wholly-owned subsidiaries.
 - vii. Page 5, Section B, Question 1.c – Please provide the number of acres that will remain undeveloped.
 - viii. Page 5, Section B, Question 1.j – The Department understands that the proposed project will not change the existing footage along a public thoroughfare. Please acknowledge this on the form.
 - ix. Page 5, Section B, Question 2 – Arlington references "Table A" in its response to this question. A table was not provided with the EAF. Please clarify Arlington's response.
 - x. Page 6, Section B, Question 16.a – An estimate in tons must be provided. Also, please provide a general description of the solid waste to be generated.
 - xi. Page 7, Section B, Question 23 – An estimate in gallons/day must be provided.
 - xii. Page 8, Section B, Question 25 – Additional approvals in the form of well transfers, well drilling permits, and well plugging permits associated with the project are required by the Department. Please include "DEC – Well Permits" under "Type" for state agencies along with any submittal dates.
5. **Map(s)** - Please prepare a map(s) at a minimum scale of 1" = 400' and include the following items. Submit as many separate maps as necessary to legibly depict the requested information.

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The Department has reviewed the maps included with the May 2012 and July 2010 storage applications. Arlington's May 2012 storage application provided revised plan view and cross-section maps. As such, where applicable, the Department reviewed the most recent submittal to determine completeness. In general, the required information on the most recent versions is either missing from the maps or the information provided is incorrect and/or requires clarification. Specific map deficiencies are provided below and must be corrected, and a revised map or maps submitted. All comments refer to Map 1, labeled as "Brinefield Map Showing Galleries" in Exhibit 2, in the May 2012 storage application, unless otherwise noted.

- a. *Location, total depth, well type, well status and API well identification number of all wells listed in the Well Status and Condition Report described in item 9 below.*
 - i. Well Nos. 30A and 31A were drilled following submittal of the May 2012 storage application. Please include these wells and their corresponding information in the inset table on the map.
 - ii. Please confirm if the surface locations for Well Nos. 30A and 31A are correct since proposed locations, and not actual locations, were likely provided on the original map.
 - iii. The casing seat locations for Well Nos. 30A and 31A must be shown on the map.
 - iv. The status for Well No. 27 in the inset table on the map shows that it is both P&A and active. Please revise the map to correctly show if this well is P&A or active.
 - v. The API number for Well No. 57 shows "02" in its event sequence number (i.e., last two digits in API number) in the inset table and Department records show that the event sequence number should be "01". Please correct the API number in the map inset table accordingly.
 - vi. The API number for Well No. 58 indicates "00" in its event sequence number in the inset table and Department records show that the event sequence number should be "01". Please correct the API number in the map inset table accordingly.
 - vii. Please refer to Item 9.a below for additional wells that need to be included in the Well Status and Condition Report, and therefore must also be included in the map inset table.
 - viii. All API numbers in the map inset table must contain 14 digits (even if last four digits are zeros). Please provide a list of correct APIs, in the appropriate 14 digit format, for all wells in the map inset table.
 - ix. Please revise the title for the map inset table from "Well Data" to "Select Well Data".
- b. *Location of all existing and proposed wells within and immediately adjacent to the storage area.*
 - i. There is an unlabeled well immediately west of Well No. 27. Please clarify if this is an actual well location, or if it is a well symbol that was shown in error. If this is an actual well location, please provide the required information on the map and in the map inset table.

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- ii. Well symbols used for the wellhead locations do not accurately and consistently show existing and proposed locations. Arlington must clearly show which wells are active, plugged/abandoned, and proposed on the map and in the legend. A minimum of three distinct symbols (active, plugged/abandoned, and proposed) must be used on the map and in the legend so that the status of each well can easily be identified. The Department recognizes that the inset table lists the status for certain wells, but it does not list all wells and for clarity, the status should be reflected in the well symbology.
 - iii. For all wells with directional surveys, a casing shoe location symbol must be shown on the map and in the legend. Please ensure each such well includes a casing shoe location.
 - iv. A majority of wells on the map have either a magenta “dot” or “donut” that is either centered or slightly off centered to the well head. Please describe what this symbol represents (e.g., casing shoe?) and include it in the legend.
 - v. A series of wells and caverns along the east side of the brinefield (Well Nos. 1 through 26) near the Seneca Lake shoreline were included on the earlier version of Map 1 (submitted with the July 2010 storage application) and are not included on the current map version. Arlington should include these wells on the map.
- c. *Plan view of the proposed reservoir boundary (i.e., existing and proposed ultimate cavern outlines which take into account directional surveys for wells). Clearly label each cavern to denote its current status, current use and proposed use under the requested permit. Include distance, in feet, between proposed ultimate cavern outlines and/or other existing caverns.*
- i. Each cavern was not clearly labeled to denote its current status, current use, or proposed use. Arlington must clearly label each cavern that is the subject of this application and also each cavern neighboring Gallery 2. Caverns that are part of a storage gallery should be labeled as such by using a gallery name label that points to each cavern within the gallery using leader lines (similar to “Finger Lakes Gallery 1” shown on the earlier Map 1 version).
 - ii. If additional sonar data from recently completed Well Nos. 30A and 31A were collected, then please update the cavern outlines accordingly. If sonars were not run, please state.
 - iii. The distances between all neighboring caverns were not provided, although distances were provided on the earlier map version. Please provide the distances between Caverns 30/30A and 33, Caverns 31/31A and 28, Caverns 31/31A and 36, Caverns 31/31A and 37, and Caverns 45 and 36.
 - iv. A consistent symbol should be used to show pressure connections between caverns and pressure connections should be labeled on the map. As a preferred alternative to using a symbol for pressure connections (e.g., dashed lines), Arlington may connect the caverns by merging the cavern outlines to show a single gallery and should use historical records in developing the dimensions of such connection.

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- v. The map legend shows the date of the cavern outlines using colors, but is ineffective, difficult to follow and appears to be outdated since it does not include the 2011 sonar work and there are colors in the legend that are not used in the map. Arlington must revise the color scheme in the legend and on the map, or use leader lines that show the sonar date used for each cavern outline. For cavern outlines drawn in the absence of sonar data, it should be stated so on the map and a basis for the interpreted outline (e.g., production records) must be provided. In all cases where sonar data was collected, the most recent sonar data should be shown as the maximum cavern outline. In the event that an older dataset (e.g., sonar survey or production record) shows a larger cavern outline, then the older dataset and most recent sonar data must be shown together (as two distinct outlines) to provide the most conservative assessment for cavern size.
 - vi. Several circles with numbers inside of them are shown on the map. Please explain what these represent and include them in the legend if applicable or delete if unnecessary.
 - vii. It is unclear which lines on the map represent access roads and which might represent piping. Please label accordingly.
 - viii. The 16-inch and 8-inch lines for Gallery 2 should be labeled as either proposed or existing, and their purpose should be identified using leader lines.
- d. *All faults or other structural or stratigraphic features depicted on the cross-sections described in item 6a below.*
- See Department comments to below Items 6.a and 6.b.
- e. *The proposed location of compressors and other surface equipment, structures, tanks, impoundments (e.g., brine ponds), discharge points, flare stacks and pipelines associated with the proposed storage operations.*
- Satisfactorily addressed by Map 1 ("Brinefield Map Showing Galleries") in Exhibit 2 in the May 2012 storage application and Map 2 ("Project Overview Map") in Exhibit 2 in the July 2010 storage application.
- f. *Notation of the applicant's surface and mineral rights within the vicinity of the proposed storage area.*
- Surface and mineral rights were included in Arlington's most recent Storage Rights Affidavit dated August 18, 2011. See Item 10 below for Department comments.
- g. *Topographic and cultural features such as roads, railroads, oil or gas pipelines, utility rights-of-way, surface waters, springs, public and private water supplies, buildings or dwellings, agricultural districts, significant landmarks and any other public area which may be used as a place of occupancy, resort, assembly, lodging, manufacture, storage or traffic.*

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Satisfactorily addressed by Map 2 (“Project Overview Map”) in Exhibit 2 in the July 2010 storage application.

6. **Reservoir Suitability Report** - *This report must document suitability of the reservoir for storage. The report must include a cavern development plan & geomechanical (including finite element analysis) study including and analyzing, but not necessarily limited to, items listed below. Note that the geomechanical study must use supportable baseline cavern information and a justifiable projection for future cavern growth-existing cavern size(s) and shape(s) must be based on reliable information such as historical cavern development records and recent sonar surveys.*

Arlington submitted its underground storage permit application (dated July 2010, revised in May 2012) including a Reservoir Suitability Report supported by exhibits to document the suitability of Gallery 2 for natural gas storage. A geomechanical evaluation, which used finite difference simulations and a gallery interaction study, was included in Exhibit 16 in the July 2010 storage application. In addition to the geomechanical evaluation, the analyses for reservoir suitability were supported by geologic and geophysical cross-sections (Exhibit 8, May 2012 and July 2010 storage applications), sonar reports and well logs (Exhibit 9, July 2010 storage application), an MIT Report (Exhibit 13, July 2010 storage application), Well Nos. 58 and 59 Core Reports and Rock Mechanics Report (Exhibits 14 and 15, July 2010 storage application), seismic data and seismic risk map (Exhibit 17, May 2012 storage application), as well as related text in the May 2012 storage application that discussed site geology (Section 4), well and cavern integrity (Section 7), cavern suitability (Section 8), seismic risk (Section 9), sonar reports and surveys (Section 10), minimum and maximum storage pressures (Section 11), and cavern development (Section 12). In addition, Arlington submitted core analysis reports for Wells Nos. 30A and 31A which were received by the Department on October 23, 2012. Specific comments related to Arlington’s documentation of reservoir suitability are provided in the below items.

- a. *Geologic cross-sections of the area shown on the map listed in item 5 showing lithologies, storage wells (including casing strings and setting depths) and overlying and underlying formations, and vertical profiles of the existing and ultimate caverns including all prior sonar surveys. These cross-sections must also depict any faults or other structural or stratigraphic features that affect either, continuity and extent of the formations shown or effectiveness of containment of gas in the storage reservoir.*

The Department reviewed Arlington’s geologic cross-sections, labeled as “Vertical Sections” in Exhibit 8, in the May 2012 storage application and geophysical cross-sections, labeled as “Structural Cross Sections” in Exhibit 8, in the July 2010 storage application. The Department’s comments on these cross-sections are provided below.

Geologic Cross-Sections (Exhibit 8, May 2012 storage application, labeled as “Vertical Sections”

- i. Well Nos. 30A and 31A were drilled after submittal of the most recent storage application and are therefore missing from the cross-sections. Arlington should revise its cross-sections to accurately show these wells based on well construction and directional survey data.

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- ii. Arlington should add a note to the cross-sections that references the source of the data (e.g., date of geophysical logs, cores, etc) used to develop the stratigraphic sections.
- iii. The top of cavern, casing seat, and current well depths were not included for caverns in Galleries 1 and 2. Please provide information similar to that provided for Well No. 58 for all wells/caverns in the cross sections. Also, the casing seat depiction for Well No. 31 appears to be too low based on casing seat and top of cavern elevation data provided in Arlington's application. Please correct if necessary or explain. Additionally, please confirm the accuracy of the original total well depth at Well No. 46, as it appears to be 80 to 90 feet above the cavern floor.

Geophysical Cross-Sections (Exhibit 8, July 2010 storage application, labeled as "Structural Cross Sections"

- iv. The transect labels in the geophysical sections appear to be transposed when compared to transect lines shown on Map 1 (e.g., cross-section drawing A-A' appears to match Map 1 transect B-B'). Arlington should review the transects on its cross-sections and plan view map and correct as needed.
 - v. The east-west geophysical cross-section (labeled as B-B' in Exhibit 8) does not include the geophysical data for Well Nos. 30 and 45 which are an integral part of the evaluation. Arlington must include the missing logs on its east-west geophysical cross-section. In addition, if available, any geophysical logs for Well Nos. 30A and 31A should be included on applicable transects based on their final surface and casing seat locations.
- b. *Discussion of the information illustrated on the cross-sections described above. Any zones or planes of weakness referenced in other published reports (e.g., Jacoby) potentially affecting the suitability of the reservoir for storage must be documented and explained in the Reservoir Suitability Report.*

Arlington provided a discussion on regional and local geology and structural features in Section 4 in the May 2012 storage application. Section 4 is supported by published reports by Jacoby, regional stratigraphic sections (Exhibit 4, July 2010 storage application), geologic cross-sections (Exhibit 8, May 2012 storage application), and site-specific isopach and structure maps for the Camillus which directly overlies the Syracuse (Exhibits 6 and 7, July 2010 storage application). Arlington stated in Section 4.2 that, based on its site-specific isopach and structure maps, there is no evidence of faulting in the Camillus shale caprock.

Published work by Jacoby and Dellwig (1974) describes a major north-south trending strike-slip fault that appears to be within the vicinity of Gallery 1, which Arlington also addresses in its storage application since this gallery is in close proximity to adjacent Gallery 2. The Department recognizes that the presence of this fault has not impacted storage operations in Gallery 1 and that the fault is sealed based on Arlington's discussion in Section 4.2 in its May 2012 storage application, which includes the fact that Gallery 1 has operated as a natural gas storage gallery for over 15 years without leakage.

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- i. Arlington submitted geophysical cross-sections in addition to its geologic cross-sections in Exhibit 8. Although a discussion on structure was provided by Arlington and supported using the geologic cross-sections, isopach map, and structure map, a discussion on the geophysical cross-sections was not provided. In addition, as noted above in Item 6.a, the east-west geophysical cross-section did not include two of the primary wells in Gallery 2. A discussion on the analysis of the geophysical results and correlation between wells within and surrounding Gallery 2 must be provided. Specifically, Arlington must determine if repeated or missing sections were observed within the logs that might suggest faulting in the overlying Camillus. If a discussion on the geophysical logs has already been provided, please direct the Department to the relevant Exhibit or Section.
 - ii. On Page 6 in the May 2012 storage application, the text states that “salt beds are intensely folded into a series of local east-west anticlines and synclines with only few tens of feet from crest to crest”, and then references Exhibit 5 in the July 2010 storage application. Exhibit 5 (which is labeled as Figure 8) does not appear to show this, but rather shows the structure above the Salina. Please clarify if this exhibit should rather be referenced later in the paragraph where “broad, gentle east-west anticlines and synclines” of overlying sediments are discussed.
 - iii. The Department received Arlington’s core analysis reports for Well Nos. 30A and 31A on October 23, 2012. Please refer to the Department’s comments under Item 6.c below.
- c. *Discussion of any core test results including caprock and salt properties.*

Arlington submitted core description and activity reports for Well Nos. 58 and 59 in Exhibit 14 and a rock mechanics report in Exhibit 15 in the July 2010 storage application. Subsequently, Arlington submitted core analysis reports for Well Nos. 30A and 31A, which were received by the Department on October 23, 2012. See below for the Department’s comments.

- i. On Page 13 in the May 2012 storage application report text, Arlington states that cores were collected from Well Nos. 46 and 59. Please clarify if a core was collected from Well No. 46, or if this statement was written in error.
- ii. Arlington must provide a narrative for the Well Nos. 30A and 31A core analysis reports. The narrative, at a minimum, should include a discussion on the objective, results, and conclusions with regards to the core analyses for these wells, including:
 - a. Discuss the entries in the “Comments” column that is included in the “Brief Description” table in the Well No. 30A core analysis report. A discussion must also be provided for the same column in the table that Arlington will provide for Well No. 31A (refer to the Department’s comment under Item 6.c.iii).
 - b. Include a correlation of the core data to the formation depths in the cross-sections.

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- iii. The “Brief Description” table in the Well No. 30A core analysis report was not included in the Well No. 31A core analysis report. Arlington must include this table for Well No. 31A in its revised submission or explain why it was omitted.
- iv. If obtained, RQD percentages for rock cores and any on-site observation of recovered cores must be included for Well Nos. 30A and 31A in Arlington’s revised submission.
- d. *Description of the material to be stored and analysis of the physical and operational parameters required for safe containment of the stored material and any displacement fluid for the life of the project.*
 - i. Arlington states that natural gas will be stored in Gallery 2 and that displaced brine will be sent to US Salt. Arlington must provide the Department with an MSDS for natural gas. In addition, the Department requests that all displaced brine be metered or otherwise measured volumetrically during de-brining, if the facility is ultimately permitted. Comments on the analysis of physical and operational parameters are addressed below and in Item 6.e.
 - ii. Arlington completed a geomechanical evaluation using finite difference simulations to evaluate Gallery 2 suitability for natural gas storage. The geomechanical model parameters were based, in part, on cavern dimensions derived from sonar data collected during 1997 and 1978 for Well Nos. 30 and 31, respectively. These were the most recent data sets available at the time the evaluation was completed. However, recent sonar data from 2011 shows that the cavern span and volume at Well Nos. 30 and 31 are slightly different than when the geomechanical evaluation was completed. In addition, sonar data is now available for Well No. 45 which was not included in the model, albeit the volume in Well No. 45 is relatively small. Although it is recognized that the cavern volume used for the model is conservative, the Department requires a statement that the previously performed geomechanical evaluation is applicable to the recently determined cavern spans and volumes, and that the conclusions in the geomechanical analysis remain valid.
 - iii. Gallery 1 was included in the geomechanical model to evaluate interaction between Galleries 1 and 2 during gas storage cycles. While we acknowledge that the Well No. 28 cavern is relatively small and deeper than other caverns in Gallery 1, Arlington must confirm that this is the reason or otherwise explain why it was not necessary to include this cavern in the model to evaluate interaction between the galleries during gas storage.
- e. *Existing and proposed total storage capacity which includes rubble pile capacity, if any, and minimum and maximum operating storage pressures. The underground storage permit for the facility will specify total capacity; any future increase in permitted total capacity, however caused, will require an underground storage modification permit in accordance with ECL §23-1301(5)(b).*

On Page 3 in the May 11, 2012 storage application, Arlington states that total natural gas storage capacity in Gallery 2, which includes rubble pile capacity, will be 0.75 Bcf, consisting of 0.55 Bcf working gas and 0.20 Bcf of base gas. Further, Arlington states that the maximum withdrawal rate will be 50,000 Mcf and that the minimum and maximum Gallery 2 wellhead

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pressures will be 400 psig and 1,669 psig, respectively. The minimum operating pressure is based on the Gallery 1 permitted minimum wellhead pressure (400 psig) and the maximum operating pressure is based on the 1997 MIT results (1,669 psig). The total natural gas storage capacity is based on a gallery volume of 1,000,000 barrels (based on US Salt production records), the maximum wellhead pressure derived from the 1997 MIT (Exhibit 13), and the geomechanical evaluation results (Exhibit 16).

- i. Arlington must provide minimum and maximum casing shoe pressures for all Gallery 2 wells. In addition, minimum and maximum casing shoe pressures must be provided for all Gallery 1 wells, since proposed wellhead pressures are based, in part, on data collected from this gallery.
 - ii. On Page 3 in the May 11, 2012 storage application, Arlington states that the rubble porosity is 32%. Arlington should explain the basis for this estimate.
- f. *Past and current sonar reports and surveys, and schedule for future sonar surveys. Sonar schedules must take into account the cavern development plan. Any other materials including other types of surveys and/or determinations of current cavern size and shape including records of prior cavern development. Directional surveys for wells for determining spatial relationship of caverns.*
- i. Directional surveys for Well Nos. 30, 31 and 45 were provided in Exhibit 12 in the May 2012 storage application. Arlington must provide directional surveys for recently drilled Well Nos. 30A and 31A.
 - ii. Sonar reports for 1978 (Well Nos. 30 and 31) and 2011 (Well Nos. 30, 31, and 45) were provided in Exhibit 9 in the May 2012 storage application. However, the report did not include sonar reports for 1981 (Well No. 30) and 1997 (Well No. 30), as described in Section 6.1 on Page 8 in the May 2012 storage application. Arlington must provide the 1981 and 1997 sonar reports for Well No. 30.
 - iii. As indicated by Arlington, a schedule for future sonar surveys is not required due to lack of anticipated cavern growth during storage of natural gas. However, should future conditions or circumstances warrant the need for additional sonar surveys, the Department may require Arlington to complete such surveys.
- g. *Discussion of historical earthquake activity, if any, within a one-half mile radius of the project area.*
- Satisfactorily addressed by Section 9 "Review of Historic Earthquake Activity/Seismic Risk" and Exhibit 17 "NEIC: Earthquake Search Results" in the May 2012 storage application.
- h. *Proposed safety and emergency shut-down systems for the storage facility. Upon review of items a through h, the Department may require additional geologic and/or engineering analysis to further support the applicant's proposed operations.*

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Salt Point Storage Field, Reading, Schuyler County

Satisfactorily addressed by Section 15 “Safety and Emergency Shutdown Systems” and Exhibit 20 “Emergency Action Plan” in the May 2012 storage application.

7. **Subsidence Monitoring Plan** - *The subsidence monitoring plan must take into account the cavern development plan.*

The Department requires more frequent subsidence monitoring than what was proposed by Arlington for the three-year period (i.e., several storage cycles) following the first year of semi-annual surveying after initial pressurization. Arlington must revise Exhibit 19 (specifically Section III B, second sentence) in the July 2010 storage application to state that, “Subsequent surveys for the next three years shall occur every year. Provided there are no detrimental indicators, all following surveys shall occur every two years.” Similar edits must also be made in the second paragraph (last sentence) in Section 14 in the May 2012 storage application.

8. **Mechanical Integrity Testing (“MIT”) Plan** - *Proposed MIT pressures must be accounted for in the geomechanical analysis.*

Arlington discussed mechanical integrity testing in Section 16 in the May 2012 storage application and provided an MIT plan in Exhibit 21 in the July 2010 storage application. See below for comments on the MIT plan and report text. Arlington must respond to the Department’s comments on Section 16 and submit a revised MIT plan that addresses comments on Exhibit 21.

- a. It is understood that the cavern will be subjected to a long-term brine test (per 8.f. below) and the wells (and casing seats) will be subjected to a nitrogen-brine interface MIT prior to cavern dewatering, and that MITs will not be performed during routine cavern operation. For these reasons, it is understood that the geomechanical analysis does not need to consider proposed MIT pressures—please verify this understanding or provide a reference where MIT pressures are considered in the geomechanical analysis.
- b. Section 16 states that there is “no need to conduct future MITs or brine interface tests” following the initial nitrogen-brine interface test. Arlington’s rationale is that ongoing cavern integrity during proposed operation will be assessed by observing pressures and that no additional solutioning will occur. Arlington should elaborate on how it will evaluate cavern integrity using operational data (i.e., periodic long-term shut-in tests, etc.).
- c. In Step 4 of the MIT plan, Arlington states that wells will be prepared for “nitrogen or natural gas injection.” Please be advised that the Department requires the use of nitrogen for the casing and cavern MITs on the basis that (i) this is the initial test since gallery re-entry, (ii) well recompletion work has occurred since gallery re-entry, and (iii) new wells have been drilled into the gallery since re-entry. Natural gas should not be used to test casing and cavern integrity considering these circumstances. Nitrogen must be used for the casing and cavern MITs.
- d. The wells that will be tested were not clearly identified in the MIT plan. Although Arlington states that it will test “the wells in Gallery 2,” the Department requires more specificity as to which wells within Gallery 2 will be tested. For clarity, Well Nos. 30A and 31A require casing and cavern MITs and Well No. 45 requires a casing MIT only. Further, it is the Department’s

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understanding that Well Nos. 30 and 31 will be plugged and abandoned prior to the proposed MIT activities, thus negating the need for casing MITs at these locations, and that the casing shoe at Well Nos. 30 and 31 will be tested during the cavern MITs for their respective replacement wells (Well Nos. 30A and 31A, respectively).

- e. Specific details related to testing pressures were not provided in the MIT plan. Arlington must provide the true vertical depth of each casing seat and the proposed equivalent gradient test pressures (i.e., psi/ft. at each casing seat) for each well as part of the MIT plan.
 - f. Due to the recent drilling in Gallery 2 and the fact that Gallery 2 has not been brine tested in over ten years, the Department requires completion of a long-term brine pressure test (e.g., 1-week period after stabilization) of Gallery 2 prior to performing the above noted MITs.
 - g. Arlington is required to submit the long-term brine test and MIT results to the Department for review and approval following completion of the tests. However, please note these tests may be conducted subsequent to possible issuance of the storage permit but prior to de-brining.
9. **Well Status and Condition Report** - *The purpose of this report is to show that prior to commencement of storage operations, the condition of all wells located within and immediately adjacent to the storage area is such that storage gas containment is not compromised. Please include the following items.*

The Department has reviewed the Well Status and Condition Report provided in Exhibit 11 in the May 2012 storage application. The Department's comments are provided below.

- a. *A well summary covering all plugged and unplugged wells which documents the well use histories and current status or downhole condition of each well.*

Arlington provided a summary for Well Nos. 30, 31 and 45. Since Well Nos. 30A and 31A have been completed, Arlington must revise its Well Status and Condition Report to include these wells. Additionally, Arlington should include wells located immediately adjacent to Gallery 2 (e.g., Well Nos. 28, 33, 35, 36, 37, 58) in its revised summary.

- b. *A proposed remediation plan, as necessary, for wells described in item a above which are not adequately completed or plugged to ensure storage gas containment.*

Arlington states that Well Nos. 30 and 31 will be plugged and abandoned and that Well No. 45 will be recompleted. Appropriate well permits must be secured from the Region 8 office.

- c. *A proposed monitoring/observation well protocol, if any, which lists proposed monitoring/observation wells, identifies their locations and describes the purpose, methodology and frequency of the planned monitoring and observation.*

Well No. 45 is proposed for use as a monitoring well, however, the methodology and frequency of planned monitoring was not provided. Arlington should specifically state what will be monitored at this well, how it will be monitored, and the frequency of such monitoring.

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Prior to commencing any work on an existing or new well, including re-entry, drilling, conversion and plugging, the applicant must contact the Regional Minerals Manager listed on Attachment 2 to determine application, notification and/or permitting requirements for individual wells in accordance with 6NYCRR Parts 550 - 559.

To date, satisfactorily addressed.

10. **Storage Rights Affidavit** - *Please provide an affidavit stating that the applicant has acquired at least 75 % of the storage rights within the proposed storage formation in the reservoir and buffer zone, and reference and include a lease tract map. In addition to the affidavit itself, include a tabulation which corresponds to the lease tract map of the names and complete mailing addresses of all surface owners within and adjacent to the proposed storage area (reservoir and buffer zone).*

The Department received Arlington's most recent Storage Rights Affidavit dated August 18, 2011. The affidavit needs to be updated to show recently completed Well Nos. 30A and 31A and Arlington Storage Company, LLC's ownership of all wells in the Storage Rights Tabulation. A complete updated affidavit must be submitted to the Department.

11. **Permit Application Fee** - *The permit fee for a modification to an existing storage facility is \$5,000 and \$10,000 for a new underground storage facility (including any proposal to store natural gas in caverns previously used or currently permitted or used to store LPG).*

Satisfactorily addressed. Arlington requested a modification to an existing storage facility by submission of its application and therefore the permit application fee is \$5,000. The fee was received by the Department on July 2, 2010. Please find attached Receipt No. 572330.

12. **General Comments** – The Department understands that Arlington has existing Federal Energy Regulatory Commission (FERC or Commission) automatic authorization for storage testing and development of the subject facility in accordance with 18 CFR § 157.215 under “Subpart F— Interstate Pipeline Blanket Certificates and Authorization Under Section 7 of the Natural Gas Act for Certain Transactions and Abandonment.” In its August 26, 2010 Order Issuing Certificate and Approving Abandonment (Docket Nos. CP10-99-000 & CP10-100-000), FERC stated and affirmed “We also confirm that the Part 157, Subpart F blanket certificate issued at the same time authorizes construction and operation of certain facilities and certain amendments and abandonments all as described in Part 157, Subpart F of the Commission’s regulations.” The Department further understands that prior to putting Gallery 2 into natural gas storage service, Arlington will file an abbreviated application with FERC requesting authorization to provide services to customers using Gallery 2 storage capacity. Concurrent with Arlington’s submission to FERC, this office requests that it be provided a copy of Arlington’s abbreviated application.

32-01-3 (8/90)-101



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

RECEIPT

NUMBER
572330

Region Number JA

Date 8-18-11

Location central office Division Mineral Resources

Received of Hillington Storage Company

In the amount of _____ \$ 5,000.00

For Application fee for ECL Article 23 Title 13 underground storage
modification permit Salt Point Storage Field.

☐ Cash Department Representative Samantha Lewint

☒ Check Number 1888 Title Clerk

☐ Money Order

ORIGINAL

Arlington Storage
ARLINGTON STORAGE COMPANY, LLC

Seneca Lake Storage Facility
Gallery 2

Application for Underground Natural
Gas Storage Modification Permit

Response to DEC November 6, 2012
Notice of Incomplete Application

December 19, 2012

**Response of Arlington Storage Company, LLC to DEC's November 6, 2012
Notice of Incomplete Application ("NOIA")**

=====

1. **Organizational Report** - All well owners, operators, drillers and pluggers must file a notarized form with DMN prior to commencing any regulated activity, including preparatory work on the well site. The well owner may authorize other persons to sign all subsequent submittals to the Department by listing them on the Organizational Report form. An updated Organizational Report must be filed with the Department when a change in address or corporate structure occurs.

DEC Comment: Arlington's April 10, 2012 Organization Report must be updated, and a revised Organizational Report filed with the Department due to recent management changes within the company.

Arlington Response: *A revised Organizational Report for Arlington, as well as for other Inergy entities, has been provided to the Department under separate cover.*

2. **Financial Security** - Adequate financial security is required prior to issuance of any well drilling permit or approval of any well transfer request.

DEC Comment: Satisfactorily addressed. Arlington must continue to maintain adequate financial security for its wells at all times.

Arlington Response: *No response required.*

3. **Transfer of Well Plugging Responsibilities** - Approval of such transfer requires properly completed request for transfer forms, followed by compliance inspection of the wells by Regional staff and verification of financial security.

DEC Comment: Satisfactorily addressed. Project records indicate that Well No. 30 was properly transferred and approved on July 12, 2011. Well Nos. 31 and 45 were plugged and abandoned by a previous operator. Following Arlington's acquisition of the Seneca Lake Storage Facility from New York State Electric & Gas Corporation (NYSEG) on July 13, 2011, Arlington properly applied for and received approvals on August 15, 2011 to re-enter Well Nos. 31 and 45, and concurrently filed appropriate financial security, and thus accepted well plugging responsibilities at the time of permit

issuance at each well. Arlington re-entered Well Nos. 31 and 45 on October 11, 2011 and September 22, 2011, respectively.

Arlington Response: *No response required.*

4. **Full Environmental Assessment Form** - In contrast to the individual Environmental Assessment Form required with each drilling permit application, the Full Environmental Assessment Form ("EAF") is required to address the whole storage project, including any compressor site, any proposed lateral pipelines to power plants or transmission lines, and any proposed discharges. The Full EAF will be used to identify:

- a. Any need for additional Department permits including those that address brine handling and discharge/disposal.

DEC Comment: Arlington provided an EAF with its storage application dated July 1, 2010. The following comments must be addressed, and a revised form submitted.

- i. Page 2, Part 1 - The address of the storage facility under "Location of Action" must be revised to include the municipality and county.
- ii. Page 2, Part 1 - The name provided for "Name of Applicant/Sponsor" does not match the name on the Organizational Report currently on file. The "Name of Applicant/Sponsor" must exactly match the revised Organizational Report that will be submitted by Arlington pursuant to the Department's comment under Item 1 above. Please correct this page.
- iii. Page 3, Section A, Question 2 - Arlington states that *meadow or brushland* presently occupies 2.0 acres and will continue to occupy 2.0 acres after completion. Based on Pages 5 and 18 in the May 2012 storage application, it is the Department's understanding that 0.34 acres will be permanently used during operation of the facility. Please clarify if the 0.34 acres is part of the 2.0 acres of *meadow or brushland*. If it is part of the 2.0 acres, and the land type for the 0.34 acres will not consist of *meadow or brushland* after completion of the project, then the approximate *meadow or brushland* acreage after completion of the project needs to be revised accordingly.

- iv. Page 3, Section A, Question 8 - Depth to the water table at the proposed storage cavern location must be provided. Please provide an estimated depth in feet.
- v. Page 3, Section A, Question 10 - It is the Department's understanding that "hunting, fishing, or shell fishing" is not an opportunity at the immediate project site. Please revise the response to "No."
- vi. Page 5, Section B, Question 1.a - Please revise the response to include acreage for the project sponsor only, and do not include acreage for the parent company or its other wholly-owned subsidiaries.
- vii. Page 5, Section B, Question 1.c - Please provide the number of acres that will remain undeveloped.
- viii. Page 5, Section B, Question 1.j - The Department understands that the proposed project will not change the existing footage along a public thoroughfare. Please acknowledge this on the form.
- ix. Page 5, Section B, Question 2 - Arlington references "Table A" in its response to this question. A table was not provided with the EAF. Please clarify Arlington's response.
- x. Page 6, Section B, Question 16.a - An estimate in tons must be provided. Also, please provide a general description of the solid waste to be generated.
- xi. Page 7, Section B, Question 23 - An estimate in gallons/day must be provided.
- xii. Page 8, Section B, Question 25 - Additional approvals in the form of well transfers, well drilling permits, and well plugging permits associated with the project are required by the Department. Please include "DEC - Well Permits" under "Type" for state agencies along with any submittal dates.

Arlington Response: A revised EAF is attached as ***Exhibit A*** to this Response.

5. **Map(s)** - Please prepare a map(s) at a minimum scale of 1" = 400' and include the following items. Submit as many separate maps as necessary to legibly depict the requested information.

DEC Comment: The Department has reviewed the maps included with the May 2012 and July 2010 storage applications. Arlington's May 2012 storage application provided revised plan view and cross-section maps. As such, where applicable, the Department reviewed the most recent submittal to determine completeness. In general, the required information on the most recent versions is either missing from the maps or the information provided is incorrect and/or requires clarification. Specific map deficiencies are provided below and must be corrected, and a revised map or maps submitted. All comments refer to Map 1, labeled as "Brinefield Map Showing Galleries" in Exhibit 2, in the May 2012 storage application, unless otherwise noted.

- a. Location, total depth, well type, well status and API well identification number of all wells listed in the Well Status and Condition Report described in item 9 below.
 - i. Well Nos. 30A and 31A were drilled following submittal of the May 2012 storage application. Please include these wells and their corresponding information in the inset table on the map.
 - ii. Please confirm if the surface locations for Well Nos. 30A and 31A are correct since proposed locations, and not actual locations, were likely provided on the original map.
 - iii. The casing seat locations for Well Nos. 30A and 31A must be shown on the map.
 - iv. The status for Well No. 27 in the inset table on the map shows that it is both P&A and active. Please revise the map to correctly show if this well is P&A or active.
 - v. The API number for Well No. 57 shows "02" in its event sequence number (i.e., last two digits in API number) in the inset table and Department records show that the event sequence number should be "01". Please correct the API number in the map inset table accordingly.
 - vi. The API number for Well No. 58 indicates "00" in its event sequence number in the inset table and Department records show

that the event sequence number should be "01". Please correct the API number in the map inset table accordingly.

- vii. Please refer to Item 9.a below for additional wells that need to be included in the Well Status and Condition Report, and therefore must also be included in the map inset table.
- viii. All API numbers in the map inset table must contain 14 digits (even if last four digits are zeros). Please provide a list of correct APIs, in the appropriate 14 digit format, for all wells in the map inset table.
- ix. Please revise the title for the map inset table from "Well Data" to "Select Well Data."

Arlington Response: *The "Brinefield Map Showing Galleries" has been revised to account for the above comments and is attached as **Exhibit B** to this Response. The surface locations for Well Nos. 30A and 31A are based on the directional surveys performed at the time of drilling. See also Response to Comment 6.f.i.*

- b. Location of all existing and proposed wells within and immediately adjacent to the storage area.
 - i. There is an unlabeled well immediately west of Well No. 27. Please clarify if this is an actual well location, or if it is a well symbol that was shown in error. If this is an actual well location, please provide the required information on the map and in the map inset table.
 - ii. Well symbols used for the wellhead locations do not accurately and consistently show existing and proposed locations. Arlington must clearly show which wells are active, plugged/abandoned, and proposed on the map and in the legend. A minimum of three distinct symbols (active, plugged/abandoned, and proposed) must be used on the map and in the legend so that the status of each well can easily be identified. The Department recognizes that the inset table lists the status for certain wells, but it does not list all wells and for clarity, the status should be reflected in the well symbology.

- iii. For all wells with directional surveys, a casing shoe location symbol must be shown on the map and in the legend. Please ensure each such well includes a casing shoe location.
- iv. A majority of wells on the map have either a magenta "dot" or "donut" that is either centered or slightly off centered to the well head. Please describe what this symbol represents (e.g., casing shoe?) and include it in the legend.
- v. A series of wells and caverns along the east side of the brinefield (Well Nos. 1 through 26) near the Seneca Lake shoreline were included on the earlier version of Map 1 (submitted with the July 2010 storage application) and are not included on the current map version. Arlington should include these wells on the map.

Arlington Response: *The "Brinefield Map Showing Galleries" (Exhibit B) has been revised to account for these comments. The unlabeled well west of Well No. 27 was shown in error and has been removed from the map.*

- c. Plan view of the proposed reservoir boundary (i.e., existing and proposed ultimate cavern outlines which take into account directional surveys for wells). Clearly label each cavern to denote its current status, current use and proposed use under the requested permit. Include distance, in feet, between proposed ultimate cavern outlines and/or other existing caverns.
 - i. Each cavern was not clearly labeled to denote its current status, current use, or proposed use. Arlington must clearly label each cavern that is the subject of this application and also each cavern neighboring Gallery 2. Caverns that are part of a storage gallery should be labeled as such by using a gallery name label that points to each cavern within the gallery using leader lines (similar to "Finger Lakes Gallery 1" shown on the earlier Map 1 version).
 - ii. If additional sonar data from recently completed Well Nos. 30A and 31A were collected, then please update the cavern outlines accordingly. If sonars were not run, please state.
 - iii. The distances between all neighboring caverns were not provided, although distances were provided on the earlier map version. Please provide the distances between Caverns 30/30A and 33,

Caverns 31/31A and 28, Caverns 31/31A and 36, Caverns 31/31A and 37, and Caverns 45 and 36.

- iv. A consistent symbol should be used to show pressure connections between caverns and pressure connections should be labeled on the map. As a preferred alternative to using a symbol for pressure connections (e.g., dashed lines), Arlington may connect the caverns by merging the cavern outlines to show a single gallery and should use historical records in developing the dimensions of such connection.
- v. The map legend shows the date of the cavern outlines using colors, but is ineffective, difficult to follow and appears to be outdated since it does not include the 2011 sonar work and there are colors in the legend that are not used in the map. Arlington must revise the color scheme in the legend and on the map, or use leader lines that show the sonar date used for each cavern outline. For cavern outlines drawn in the absence of sonar data, it should be stated so on the map and a basis for the interpreted outline (e.g., production records) must be provided. In all cases where sonar data was collected, the most recent sonar data should be shown as the maximum cavern outline. In the event that an older dataset (e.g., sonar survey or production record) shows a larger cavern outline, then the older dataset and most recent sonar data must be shown together (as two distinct outlines) to provide the most conservative assessment for cavern size.
- vi. Several circles with numbers inside of them are shown on the map. Please explain what these represent and include them in the legend if applicable or delete if unnecessary.
- vii. It is unclear which lines on the map represent access roads and which might represent piping. Please label accordingly.
- viii. The 16-inch and 8-inch lines for Gallery 2 should be labeled as either proposed or existing, and their purpose should be identified using leader lines.

Arlington Response: The "Brinefield Map Showing Galleries" (Exhibit B) has been revised to account for the above comments. Sonar data was not collected in connection with the recent drilling of Well Nos. 30A and 31A. The circles with numbers on the older map have been removed as unnecessary.

- d. All faults or other structural or stratigraphic features depicted on the cross-sections described in item 6a below.

DEC Comment: See Department comments to below Items 6.a and 6.b.

Arlington Response: *In its application, Arlington has made clear that*

[REDACTED]
[REDACTED]
[REDACTED] When faulted, brittle rocks may or may not become sealed to fluid or gas migration along or across the fault. Crystallization of some minerals such as calcite may seal off movement of formation fluid across faults in brittle formations.

By comparison, at Watkins Glen and other bedded salt deposits in New York, when the [REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] While there may be [REDACTED]
[REDACTED] based on both successful natural gas and LPG storage over the last nearly 50 years, that [REDACTED]
[REDACTED]

There are no [REDACTED]
[REDACTED]
[REDACTED]

Nos. 30 and

New replacement Well Nos. 30A and 31A have been engineered and constructed for natural gas storage service within the previously developed caverns at adjacent Well Nos. 30 and 31. Those old wells in the past, for a total of 20 years from 1964 to 1984, have proven the integrity and soundness of this salt cavern by storing millions of barrels of liquefied petroleum gas and recovering the same [REDACTED]
[REDACTED] from the caverns. In addition, Seneca Storage Gallery 1 has also proved to maintain sufficient cavern integrity to safely store hydrocarbons since 1995.

See also response to Comment 6.a and 6.b below.

- e. The proposed location of compressors and other surface equipment, structures, tanks, impoundments (e.g., brine ponds), discharge points, flare stacks and pipelines associated with the proposed storage operations.

DEC Comment: Satisfactorily addressed by Map 1 ("Brinefield Map Showing Galleries") in Exhibit 2 in the May 2012 storage application and Map 2 ("Project Overview Map") in Exhibit 2 in the July 2010 storage application.

Arlington Response: *No response required.*

- f. Notation of the applicant's surface and mineral rights within the vicinity of the proposed storage area.

DEC Comment: Surface and mineral rights were included in Arlington's most recent Storage Rights Affidavit dated August 18, 2011. See Item 10 below for Department comments.

Arlington Response: *Arlington's ownership is now depicted on the "Brinefield Map Showing Galleries" (Exhibit B). A revised Storage Rights Affidavit has also been prepared in response to Comment 10.*

- g. Topographic and cultural features such as roads, railroads, oil or gas pipelines, utility rights-of-way, surface waters, springs, public and private water supplies, buildings or dwellings, agricultural districts, significant landmarks and any other public area which may be used as a place of occupancy, resort, assembly, lodging, manufacture, storage or traffic.

DEC Comment: Satisfactorily addressed by Map 2 ("Project Overview Map") in Exhibit 2 in the July 2010 storage application.

Arlington Response: *No response required.*

6. **Reservoir Suitability Report** - This report must document suitability of the reservoir for storage. The report must include a cavern development plan & geomechanical (including finite element analysis) study including and analyzing, but not necessarily limited to, items listed below. Note that the geomechanical study must use supportable baseline cavern information and a justifiable

projection for future cavern growth-existing cavern size(s) and shape(s) must be based on reliable information such as historical cavern development records and recent sonar surveys.

DEC Comment: Arlington submitted its underground storage permit application (dated July 2010, revised in May 2012) including a Reservoir Suitability Report supported by exhibits to document the suitability of Gallery 2 for natural gas storage. A geomechanical evaluation, which used finite difference simulations and a gallery interaction study, was included in Exhibit 16 in the July 2010 storage application. In addition to the geomechanical evaluation, the analyses for reservoir suitability were supported by geologic and geophysical cross-sections (Exhibit 8, May 2012 and July 2010 storage applications), sonar reports and well logs (Exhibit 9, July 2010 storage application), an MIT Report (Exhibit 13, July 2010 storage application), Well Nos. 58 and 59 Core Reports and Rock Mechanics Report (Exhibits 14 and 15, July 2010 storage application), seismic data and seismic risk map (Exhibit 17, May 2012 storage application), as well as related text in the May 2012 storage application that discussed site geology (Section 4), well and cavern integrity (Section 7), cavern suitability (Section 8), seismic risk (Section 9), sonar reports and surveys (Section 10), minimum and maximum storage pressures (Section 11), and cavern development (Section 12). In addition, Arlington submitted core analysis reports for Well Nos. 30A and 31A which were received by the Department on October 23, 2012. Specific comments related to Arlington's documentation of reservoir suitability are provided in the below items.

- a. Geologic cross-sections of the area shown on the map listed in item 5 showing lithologies, storage wells (including casing strings and setting depths) and overlying and underlying formations, and vertical profiles of the existing and ultimate caverns including all prior sonar surveys. These cross-sections must also depict any faults or other structural or stratigraphic features that affect either, continuity and extent of the formations shown or effectiveness of containment of gas in the storage reservoir.

DEC Comment: The Department reviewed Arlington's geologic cross-sections, labeled as "Vertical Sections" in Exhibit 8, in the May 2012 storage application and geophysical cross-sections, labeled as "Structural Cross Sections" in Exhibit 8, in the July 2010 storage application. The Department's comments on these cross-sections are provided below.

Geologic Cross-Sections (Exhibit 8, May 2012 storage application, labeled as "Vertical Sections")

- i. Well Nos. 30A and 31A were drilled after submittal of the most recent storage application and are therefore missing from the cross-sections. Arlington should revise its cross-sections to accurately show these wells based on well construction and directional survey data.
- ii. Arlington should add a note to the cross-sections that references the source of the data (e.g., date of geophysical logs, cores, etc) used to develop the stratigraphic sections.
- iii. The top of cavern, casing seat, and current well depths were not included for caverns in Galleries 1 and 2. Please provide information similar to that provided for Well No. 58 for all wells/caverns in the cross sections. Also, the casing scat depiction for Well No. 31 appears to be too low based on casing seat and top of cavern elevation data provided in Arlington's application. Please correct if necessary or explain. Additionally, please confirm the accuracy of the original total well depth at Well No. 46, as it appears to be 80 to 90 feet above the cavern floor.

Arlington Response: *Vertical Cross-Section A-A' has been revised to show Well Nos. 30A and 31A, add notes regarding the source of the data, and add information (e.g., top of cavern, casing seat, and current well depth) for each well shown. Vertical Cross-Section B-B' has also been revised to show Well No. 31A. The revised cross-sections are attached as **Exhibit C** to this Response. The latest depth for the casing seat in Well No. 31 is 2,362 feet based on the November 2011 sonar. The original total depth of Well No. 46 was 2,082 feet and was used for washing the cavern space. It is accurately depicted on the cross-section.*

Geophysical Cross-Sections (Exhibit 8, July 2010 storage application, labeled as "Structural Cross Sections")

- iv. The transect labels in the geophysical sections appear to be transposed when compared to transect lines shown on Map 1 (e.g., cross-section drawing A-A' appears to match Map 1 transect B-B').

Arlington should review the transects on its cross-sections and plan view map and correct as needed.

- v. The east-west geophysical cross-section (labeled as B-B' in Exhibit 8) does not include the geophysical data for Well Nos. 30 and 45 which are an integral part of the evaluation. Arlington must include the missing logs on its east-west geophysical cross-section. In addition, if available, any geophysical logs for Well Nos. 30A and 31 A should be included on applicable transects based on their final surface and casing seat locations.

Arlington Response: *The labels on the structural cross-section maps have been corrected. Revised Geophysical Cross-Sections A-A' and B-B' are attached as **Exhibit D** to this Response. Two additional geophysical cross-sections have been prepared. Attached as **Exhibit E** to this Response is a "West to East Structural Cross-Section" showing Well Nos. 30, 45 and 31. Attached as **Exhibit F** to this Response is a stratigraphic cross-section showing the core logs from Well Nos. 30A and 31A.*

- b. Discussion of the information illustrated on the cross-sections described above. Any zones or planes of weakness referenced in other published reports (e.g., Jacoby) potentially affecting the suitability of the reservoir for storage must be documented and explained in the Reservoir Suitability Report.

DEC Comment: Arlington provided a discussion on regional and local geology and structural features in Section 4 in the May 2012 storage application. Section 4 is supported by published reports by Jacoby, regional stratigraphic sections (Exhibit 4, July 2010 storage application), geologic cross-sections (Exhibit 8, May 2012 storage application), and site-specific isopach and structure maps for the Camillus which directly overlies the Syracuse (Exhibits 6 and 7, July 2010 storage application). Arlington stated in Section 4.2 that, based on its site-specific isopach and structure maps, there is [REDACTED]

Published work by Jacoby and Dellwig (1974) describes a major north-south trending strike-slip fault that appears to be within the vicinity of Gallery 1, which Arlington also addresses in its storage application since this gallery is in close proximity to adjacent Gallery 2. The Department recognizes that the presence of this fault has not impacted storage operations in Gallery 1 and that the fault is

sealed based on Arlington's discussion in Section 4.2 in its May 2012 storage application, which includes the fact that Gallery I has operated as a natural gas storage gallery for over 15 years without leakage.

- i. Arlington submitted geophysical cross-sections in addition to its geologic cross-sections in Exhibit 8. Although a discussion on structure was provided by Arlington and supported using the geologic cross-sections, isopach map, and structure map, a discussion on the geophysical cross-sections was not provided. In addition, as noted above in Item 6.a, the east-west geophysical cross-section did not include two of the primary wells in Gallery 2. A discussion on the analysis of the geophysical results and correlation between wells within and surrounding Gallery 2 must be provided. Specifically, Arlington must determine if repeated or missing sections were observed within the logs that might suggest faulting in the overlying Camillus. If a discussion on the geophysical logs has already been provided, please direct the Department to the relevant Exhibit or Section.

Arlington Response: *Arlington has created a separate West to East structural cross-section to complement Geophysical Cross-Section B-B'. See previously referenced **Exhibit E**. The West to East cross-section illustrates the structural relationship of all of the formations from the Syracuse salt to the lower part of the Hamilton Shale. The [REDACTED] is demonstrated.*

Since there are [REDACTED]

[REDACTED] this cross-section confirms that [REDACTED]

The same [REDACTED] was also previously illustrated in Structural Cross-Sections A-A' and B-B'; the [REDACTED] indicates that no [REDACTED] were observed in these [REDACTED]

*The surface elevation of Well Nos. 30A and 31A are the same so the drilling depth of the formations for all practical purposes compares them structurally as well as stratigraphically. The Well Nos. 30A-31A Stratigraphic Cross-Section (previously referenced **Exhibit F**) shows the [REDACTED]*

[REDACTED] Based on these observations it is clear

that there are [REDACTED] In all cases the thickness of the Camillus shale is approximately 80 feet.

- ii. On Page 6 in the May 2012 storage application, the text states that "salt beds are intensely folded into a series of local east-west anticlines and synclines with only few tens of feet from crest to crest," and then references Exhibit 5 in the July 2010 storage application. Exhibit 5 (which is labeled as Figure 8) does not appear to show this, but rather shows the structure above the Salina. Please clarify if this exhibit should rather be referenced later in the paragraph where "broad, gentle east-west anticlines and synclines" of overlying sediments are discussed.

Arlington Response: The Department is correct that Exhibit 5 to the July 2010 storage application should have been referenced later in the paragraph when discussing the "broad, gentle east-west anticlines and synclines." The Reservoir Suitability Report has been revised and is attached as **Exhibit G** to this Response.

- iii. The Department received Arlington's core analysis reports for Well Nos. 30A and 31A on October 23, 2012. Please refer to the Department's comments under Item 6.c below.

Arlington Response: See response to Comment 6.c.ii.

- c. Discussion of any core test results including caprock and salt properties.

DEC Comment: Arlington submitted core description and activity reports for Well Nos. 58 and 59 in Exhibit 14 and a rock mechanics report in Exhibit 15 in the July 2010 storage application. Subsequently, Arlington submitted core analysis reports for Well Nos. 30A and 31A, which were received by the Department on October 23, 2012. See below for the Department's comments.

- i. On Page 13 in the May 2012 storage application report text, Arlington states that cores were collected from Well Nos. 46 and 59. Please clarify if a core was collected from Well No. 46, or if this statement was written in error.

Arlington Response: The reference to Well No. 46 was meant to reference Well No. 58.

- ii. Arlington must provide a narrative for the Well Nos. 30A and 31A core analysis reports. The narrative, at a minimum, should include a discussion on the objective, results, and conclusions with regards to the core analyses for these wells, including:
 - a. Discuss the entries in the "Comments" column that is included in the "Brief Description" table in the Well No. 30A core analysis report. A discussion must also be provided for the same column in the table that Arlington will provide for Well No. 31A (refer to the Department's comment under Item 6.c.iii).
 - b. Include a correlation of the core data to the formation depths in the cross-sections.

Arlington Response: The primary reason that Arlington Storage proposed to core Well Nos. 30A and 31A was driven by the recognition that there appeared to be a [REDACTED]. The [REDACTED] has a gross thickness of approximately 20 feet. Arlington was interested in determining in the laboratory [REDACTED]. Modern well logs are exceptional in determining porosity but [REDACTED].

If the zone was found to [REDACTED] then it could be considered a [REDACTED]. Arlington elected to core this interval in both Well Nos. 30A and 31A so the [REDACTED].

Since the Camillus formation is the cap rock that forms the seal above the salt layer, Arlington was interested in [REDACTED]. In 1969, Rickard's general description in "Map and Chart Series

Number 12" published by the New York State Museum and Science Service included data describing the Camillus across New York, Pennsylvania, Ohio and Ontario. This generalized description included green shales, anhydrites, and dolomites. Arlington was also interested in [REDACTED]

In addition, the [REDACTED] Arlington would use this information to determine if [REDACTED]

When the core was examined there were very few [REDACTED] in the [REDACTED] and they were [REDACTED]. The same observation was made by Core Laboratories in their "Brief Description" report.

After the cores were analyzed it was determined that the [REDACTED] of the [REDACTED] was accurately predicted by the suite of well logs that were obtained in the open hole. The [REDACTED]

The analysis from both cores shows that the [REDACTED] varied from a [REDACTED] [REDACTED] and the lack of [REDACTED] makes the [REDACTED]

The core analysis of the [REDACTED] indicates that from a drilling depth of [REDACTED] feet the [REDACTED] is best described as an [REDACTED], from [REDACTED] the dominant lithology is best described as [REDACTED]

The "Brief Description" of the cores prepared by Core Laboratories provides a general description of each core. These observations were made by Mr. John Sebian, Manager at Core Laboratories in Midland, Texas. His observations include a foot by foot determination of the rock type and their relative percentages within the cored interval. Other physical characteristics were recorded such as the presence of slickensides, horizontal bedding, vertical fractures and he also identified the minerals that fill the bedding and

fractures such as NaCl (Salt) or calc. (Calcite). When he examined the core he [REDACTED] the [REDACTED] Based on this observation he concluded that the thin [REDACTED] formation was [REDACTED]

In the comments column of the Brief Description of the Core Analysis Reports, additional observations were noted such as the [REDACTED], that are commonly [REDACTED]

[REDACTED] Other notes reference the terms [REDACTED] The term [REDACTED] the interpretation that the [REDACTED] The reference to [REDACTED] indicates that [REDACTED] [REDACTED], usually occurring as one of a series of [REDACTED]

A two-well cross-section (Well Nos. 30A and 31A) has been created (previously referenced **Exhibit F**) and the location of the cored interval marked on the cross-sections relative to the formation depths.

- iii. The "Brief Description" table in the Well No. 30A core analysis report was not included in the Well No. 31A core analysis report. Arlington must include this table for Well No. 31A in its revised submission or explain why it was omitted.

Arlington Response: The "Brief Description" table for Well No. 31A, which was inadvertently omitted from the Core Analysis Reports submitted on October 22, 2012, is attached as **Exhibit H** to this Response.

- iv. If obtained, RQD percentages for rock cores and any on-site observation of recovered cores must be included for Well Nos. 30A and 31A in Arlington's revised submission.

Arlington Response: RQD percentages were not obtained. In addition, no field notes were taken as the core was incased in an aluminum tube that was cut and capped and shipped offsite for testing.

- d. Description of the material to be stored and analysis of the physical and operational parameters required for safe containment of the stored material and any displacement fluid for the life of the project.
- i. Arlington states that natural gas will be stored in Gallery 2 and that displaced brine will be sent to US Salt. Arlington must provide the Department with an MSDS for natural gas. In addition, the Department requests that all displaced brine be metered or otherwise measured volumetrically during de-brining, if the facility is ultimately permitted. Comments on the analysis of physical and operational parameters are addressed below and in Item 6.e.

Arlington Response: An MSDS for natural gas is attached as ***Exhibit I*** to this Response. Brine will be measured volumetrically during debrining as gas is injected.

- ii. Arlington completed a geomechanical evaluation using finite difference simulations to evaluate Gallery 2 suitability for natural gas storage. The geomechanical model parameters were based, in part, on cavern dimensions derived from sonar data collected during 1997 and 1978 for Well Nos. 30 and 31, respectively. These were the most recent data sets available at the time the evaluation was completed. However, recent sonar data from 2011 shows that the cavern span and volume at Well Nos. 30 and 31 are slightly different than when the geomechanical evaluation was completed. In addition, sonar data is now available for Well No. 45 which was not included in the model, albeit the volume in Well No. 45 is relatively small. Although it is recognized that the cavern volume used for the model is conservative, the Department requires a statement that the previously performed geomechanical evaluation is applicable to the recently determined cavern spans and volumes, and that the conclusions in the geomechanical analysis remain valid.

Arlington Response: The difference in past cavern sonar volumes in Gallery 2 wells, compared to the latest sonar volumes, is [REDACTED]

[REDACTED] On that basis, the initial finite difference analysis is [REDACTED] when compared to the [REDACTED] Arlington has [REDACTED]

The latest [REDACTED] in [REDACTED] does [REDACTED] The gas that will be injected into caverns Well Nos. 30A and 31A will [REDACTED] during debrining of Gallery 2. Previously performed geomechanical evaluation and conclusions are [REDACTED] and the conclusions found in the [REDACTED]

- iii. Gallery I was included in the geomechanical model to evaluate interaction between Galleries 1 and 2 during gas storage cycles. While we acknowledge that the Well No. 28 cavern is relatively small and deeper than other caverns in Gallery 1, Arlington must confirm that this is the reason or otherwise explain why it was not necessary to include this cavern in the model to evaluate interaction between the galleries during gas storage.

Arlington Response: Well [REDACTED]

[REDACTED] Well [REDACTED]

After [REDACTED]

Since both [REDACTED]

[REDACTED] and since [REDACTED]

is not [REDACTED]

[REDACTED] there was [REDACTED]

in the [REDACTED]

- e. Existing and proposed total storage capacity which includes rubble pile capacity, if any, and minimum and maximum operating storage pressures. The underground storage permit for the facility will specify total capacity; any future increase in permitted total capacity, however caused, will

require an underground storage modification permit in accordance with ECL §23-1301(5)(b).

On Page 3 in the May 11, 2012 storage application, Arlington states that total natural gas storage capacity in Gallery 2, which includes rubble pile capacity, will be 0.75 Bcf, consisting of 0.55 Bcf working gas and 0.20 Bcf of base gas. Further, Arlington states that the maximum withdrawal rate will be 50,000 Mcf and that the minimum and maximum Gallery 2 wellhead pressures will be 400 psig and 1,669 psig, respectively. The minimum operating pressure is based on the Gallery 1 permitted minimum wellhead pressure (400 psig) and the maximum operating pressure is based on the 1997 MIT results (1,669 psig). The total natural gas storage capacity is based on a gallery volume of 1,000,000 barrels (based on US Salt production records), the maximum wellhead pressure derived from the 1997 MIT (Exhibit 13), and the geomechanical evaluation results (Exhibit 16).

- i. Arlington must provide minimum and maximum casing shoe pressures for all Gallery 2 wells. In addition, minimum and maximum casing shoe pressures must be provided for all Gallery 1 wells, since proposed wellhead pressures are based, in part, on data collected from this gallery.

Arlington Response: *The existing casing shoe depth in Well No. 30 is [REDACTED] feet (sonar depth), Well No. 30A is [REDACTED] feet, Well No. 31 is [REDACTED] feet (sonar depth) and Well No. 31A is [REDACTED] feet. All pressures and mechanical integrity tests will be based on the [REDACTED] [REDACTED] with calculations for MIT purposes being based on [REDACTED] gradient. [REDACTED] Both caverns will be operated at the [REDACTED] [REDACTED]. Rock mechanics studies verify the caverns will be [REDACTED] [REDACTED].*

The above depths and assumed hydraulic gradient for the MIT results in the following pressures: [REDACTED]
[REDACTED]
[REDACTED]

¹ The difference between psig and psia is based on an additional 14 pounds of average atmospheric pressure. See e.g., Ingersoll-Rand, Compressed Air and Gas Data handbook, 3rd ED. 1980

The May 1998 MIT report by PB-KBB determined the Well Nos. [REDACTED]
[REDACTED] As noted above, Arlington is contracting
with successor company PBESS to perform a new MIT on Gallery 2
[REDACTED] to satisfy DEC requirements prior to
commencement of debrining. Even though the MIT for Gallery 2 will be
performed utilizing a [REDACTED] at the casing shoe, gas will only be
stored at the [REDACTED]
[REDACTED]

In terms of Gallery 1, the first pressure testing yielded the following
information:

- Well No. [REDACTED]
yielded a [REDACTED] at
nitrogen pressure of [REDACTED]
[REDACTED]
- Well No. [REDACTED]
[REDACTED]
- Well No. [REDACTED]
[REDACTED]
- Well No. [REDACTED]
[REDACTED]

A second test on Well No. [REDACTED]
casing seat [REDACTED] The permit for
Gallery 1 permits a maximum storage pressure at the well head of 1365
psi and establishes a minimum pressure of 400 psi which, as suggested
above, the [REDACTED]
The pressures for Gallery 2 will be [REDACTED]
[REDACTED]
[REDACTED]

- ii. On Page 3 in the May 11, 2012 storage application, Arlington states
that the rubble porosity is 32%. Arlington should explain the basis
for this estimate.

Arlington Response: A 32 percent rubble pile porosity is the
empirical Solution Mining Industry Standard (recognized in numerous

Solution Mining Research Institute papers) for bulking of rubble piles in bedded salt. The percentage is actually based on comparing the amount of brine and tonnage of salt that was removed, and the loss of space determined by multiple sonar surveys in numerous operated solution mined caverns all over the world.

- f. Past and current sonar reports and surveys, and schedule for future sonar surveys. Sonar schedules must take into account the cavern development plan. Any other materials including, other types of surveys and/or determinations of current cavern size and shape including records of prior cavern development. Directional surveys for wells for determining spatial relationship of caverns.
 - i. Directional surveys for Well Nos. 30, 31 and 45 were provided in Exhibit 12 in the May 2012 storage application. Arlington must provide directional surveys for recently drilled Well Nos. 30A and 31A.

Arlington Response: *The directional surveys for Well Nos. 30A and 31A are attached as Exhibit J.*

- ii. Sonar reports for 1978 (Well Nos. 30 and 31) and 2011 (Well Nos. 30, 31, and 45) were provided in Exhibit 9 in the May 2012 storage application. However, the report did not include sonar reports for 1981 (Well No. 30) and 1997 (Well No. 30), as described in Section 6.1 on Page 8 in the May 2012 storage application. Arlington must provide the 1981 and 1997 sonar reports for Well No. 30.

Arlington Response: *The 1997 sonar report for Well No. 30 was included with the July 2010 storage application as Exhibit 9. The 1981 sonar report for Well No. 30 is attached to this Response as Exhibit K.*

- iii. As indicated by Arlington, a schedule for future sonar surveys is not required due to lack of anticipated cavern growth during storage of natural gas. However, should future conditions or circumstances warrant the need for additional sonar surveys, the Department may require Arlington to complete such surveys.

Arlington Response: *The comment is noted; no response required.*

- g. Discussion of historical earthquake activity, if any, within a one-half mile radius of the project area.

DEC Comment: Satisfactorily addressed by Section 9 "Review of Historic Earthquake Activity/Seismic Risk" and Exhibit 17 "NEIC: Earthquake Search Results" in the May 2012 storage application.

Arlington Response: *No response required.*

- h. Proposed safety and emergency shut-down systems for the storage facility. Upon review of items a through h, the Department may require additional geologic and/or engineering analysis to further support the applicant's proposed operations.

DEC Comment: Satisfactorily addressed by Section 15 "Safety and Emergency Shutdown Systems" and Exhibit 20 "Emergency Action Plan" in the May 2012 storage application.

Arlington Response: *No response required.*

- 7. **Subsidence Monitoring Plan** - The subsidence monitoring plan must take into account the cavern development plan.

DEC Comment: The Department requires more frequent subsidence monitoring than what was proposed by Arlington for the three-year period (i.e., several storage cycles) following the first year of semi-annual surveying after initial pressurization. Arlington must revise Exhibit 19 (specifically Section III B, second sentence) in the July 2010 storage application to state that, "Subsequent surveys for the next three years shall occur every year. Provided there are no detrimental indicators, all following surveys shall occur every two years." Similar edits must also be made in the second paragraph (last sentence) in Section 14 in the May 2012 storage application.

Arlington Response: *A revised subsidence monitoring plan incorporating the requested edit is attached as **Exhibit L** to this Response. A revised Reservoir*

*Suitability Report showing the requested edit has been prepared and was previously referenced as **Exhibit G** to this Response.*

8. **Mechanical Integrity Testing ("MIT") Plan** - Proposed MIT pressures must be accounted for in the geomechanical analysis.

DEC Comment: Arlington discussed mechanical integrity testing in Section 16 in the May 2012 storage application and provided an MIT plan in Exhibit 21 in the July 2010 storage application. See below for comments on the MIT plan and report text. Arlington must respond to the Department's comments on Section 16 and submit a revised MIT plan that addresses comments on Exhibit 21.

- a. It is understood that the cavern will be subjected to a long-term brine test (per 8.f. below) and the wells (and casing seats) will be subjected to a nitrogen-brine interface MIT prior to cavern dewatering, and that MITs will not be performed during routine cavern operation. For these reasons, it is understood that the geomechanical analysis does not need to consider proposed MIT pressures – please verify this understanding or provide a reference where MIT pressures are considered in the geomechanical analysis.

Arlington Response: *Arlington verifies the Department's understanding.*

- b. Section 16 states that there is "no need to conduct future MITs or brine interface tests" following the initial nitrogen-brine interface test. Arlington's rationale is that ongoing cavern integrity during proposed operation will be assessed by observing pressures and that no additional solutioning will occur. Arlington should elaborate on how it will evaluate cavern integrity using operational data (i.e., periodic long-term shut-in tests, etc.).

Arlington Response: *PB-KBB performed a Brine pressure MIT after reentering Well No. 30 in Gallery 2 on May 1998, [REDACTED]*

[REDACTED]
[REDACTED]
[REDACTED]

Usually after the debrining, nitrogen/brine MIT is performed, no additional MIT's are performed unless the gas is removed from the cavern for a well workover.

Maximum and Minimum storage pressures were considered by Respec in their geomechanical analysis. The new MIT calculations from PBESS when performing Nitrogen/Brine MIT will consider the casing seat depths for new Well Nos. 30A and 31A that are slightly different than those found in the Respec report, but the few feet of difference between the brine pressure calculations and the new nitrogen/brine MIT calculations are expected to be within the conservative evaluation made by Respec.

On page 37 of the Respec Topical Report RSI-1574, "Geomechanical Evaluation of Natural Gas Storage in Gallery No. 2, Seneca Lake Storage Incorporated Storage Project, New York," (included as Exhibit 16 to the July 2010 storage application) prepared for PB-KBB, dated April 2002, the MIT pressures that were considered in the geomechanical analysis for both NYSEG Galleries 1 and 2 are included.

Well and cavern integrity is continuously monitored during operation as a natural gas storage vessel. Material balance of gas into and out of the cavern is maintained as well as daily pressure records and visual observations several times daily when shifts are changed. Due to maintaining continuous pressure monitoring and material balance records, no additional MIT's are required unless the cavern is voided of gas for a workover.

- c. In Step 4 of the MIT plan, Arlington states that wells will be prepared for "nitrogen or natural gas injection." Please be advised that the Department requires the use of nitrogen for the casing and cavern MITs on the basis that (i) this is the initial test since gallery re-entry, (ii) well recompletion work has occurred since gallery re-entry, and (iii) new wells have been drilled into the gallery since re-entry. Natural gas should not be used to test casing and cavern integrity considering these circumstances. Nitrogen must be used for the casing and cavern MITs.

Arlington Response: *As DEC concludes, nitrogen and not methane will be used for the MIT.*

- d. The wells that will be tested were not clearly identified in the MIT plan. Although Arlington states that it will test "the wells in Gallery 2," the Department requires more specificity as to which wells within Gallery 2 will be tested. For clarity, Well Nos. 30A and 31A require casing and cavern

MITs and Well No. 45 requires a casing MIT only. Further, it is the Department's understanding that Well Nos. 30 and 31 will be plugged and abandoned prior to the proposed MIT activities, thus negating the need for casing MITs at these locations, and that the casing shoe at Well Nos. 30 and 31 will be tested during the cavern MITs for their respective replacement wells (Well Nos. 30A and 31A, respectively).

Arlington Response: *Yes, new Well Nos. 30A and 31A will be tested using the nitrogen MIT, and Well No. 45 only a casing MIT with nitrogen.*

- e. Specific details related to testing pressures were not provided in the MIT plan. Arlington must provide the true vertical depth of each casing seat and the proposed equivalent gradient test pressures (i.e., psi/ft. at each casing seat) for each well as part of the MIT plan.

Arlington Response: *See the depths referenced in the Well Status and Condition Report (see Exhibit M discussed below) and Arlington's response to Comment 6.e.i above. As noted above, the nitrogen brine interface MIT will use a [REDACTED].*

- f. Due to the recent drilling in Gallery 2 and the fact that Gallery 2 has not been brine tested in over ten years, the Department requires completion of a long-term brine pressure test (e.g., 1-week period after stabilization) of Gallery 2 prior to performing the above noted MITs.

Arlington Response: *Long-term brine pressure testing of Gallery 2 wells will be completed prior to performing the above noted MITs and the results will be provided to the Department.*

- g. Arlington is required to submit the long-term brine test and MIT results to the Department for review and approval following completion of the tests. However, please note these tests may be conducted subsequent to possible issuance of the storage permit but prior to de-brining.

Arlington Response: *Comment noted. All test results will be provided to the Department.*

9. **Well Status and Condition Report** - The purpose of this report is to show that prior to commencement of storage operations, the condition of all wells located within and immediately adjacent to the storage area is such that storage gas containment is not compromised. Please include the following items.

DEC Comment: The Department has reviewed the Well Status and Condition Report provided in Exhibit 11 in the May 2012 storage application. The Department's comments are provided below.

- a. A well summary covering all plugged and unplugged wells which documents the well use histories and current status or downhole condition of each well.

DEC Comment: Arlington provided a summary for Well Nos. 30, 31 and 45. Since Well Nos. 30A and 31A have been completed, Arlington must revise its Well Status and Condition Report to include these wells. Additionally, Arlington should include wells located immediately adjacent to Gallery 2 (e.g., Well Nos. 28, 33, 35, 36, 37, 58) in its revised summary.

Arlington Response: *A revised Well Status and Condition Report is attached as Exhibit M to this Response.*

- b. A proposed remediation plan, as necessary, for wells described in item a above which are not adequately completed or plugged to ensure storage gas containment.

DEC Comment: Arlington states that Well Nos. 30 and 31 will be plugged and abandoned and that Well No. 45 will be recompleted. Appropriate well permits must be secured from the Region 8 office.

Arlington Response: *Arlington understands that appropriate well permits must be obtained prior to plugging and abandoning Well Nos. 30 and 31 and recompleting Well No. 45.*

- c. A proposed monitoring/observation well protocol, if any, which lists proposed monitoring/observation wells, identifies their locations and describes the purpose, methodology and frequency of the planned monitoring and observation.

DEC Comment: Well No. 45 is proposed for use as a monitoring well, however, the methodology and frequency of planned monitoring was not provided. Arlington should specifically state what will be monitored at this well, how it will be monitored, and the frequency of such monitoring.

Arlington Response: *During debrining, the pressures and volume of the brine being produced will be recorded daily. After debrining of Gallery 2 is completed, wellhead pressures and evidence of hydrocarbons will be monitored on a daily basis during shift changes for the life of the project.*

- d. Prior to commencing any work on an existing or new well, including re-entry, drilling, conversion and plugging, the applicant must contact the Regional Minerals Manager listed on Attachment 2 to determine application, not and/or permitting requirements for individual wells in accordance with 6 NYCRR Parts 550 - 559.

DEC Comment: To date, satisfactorily addressed.

Arlington Response: *No response required.*

10. **Storage Rights Affidavit** - Please provide an affidavit stating that the applicant has acquired at least 75 % of the storage rights within the proposed storage formation in the reservoir and buffer zone, and reference and include a lease tract map. In addition to the affidavit itself include a tabulation which corresponds to the lease tract map of the names and complete mailing addresses of all surface owners within and adjacent to the proposed storage area (reservoir and buffer zone).

DEC Comment: The Department received Arlington's most recent Storage Rights Affidavit dated August 18, 2011. The affidavit needs to be updated to show recently completed Well Nos. 30A and 31A and Arlington Storage Company, LLC's ownership of all wells in the Storage Rights Tabulation. A complete updated affidavit must be submitted to the Department.

Arlington Response: *A revised Storage Rights Affidavit, Storage Rights Tabulation, and Map are attached as **Exhibit N** to this Response.*

11. **Permit Application Fee** - The permit fee for a modification to an existing storage facility is \$5,000 and \$10,000 for a new underground storage facility (including any proposal to store natural gas in caverns previously used or currently permitted or used to store LPG).

DEC Comment: Satisfactorily addressed. Arlington requested a modification to an existing storage facility by submission of its application and therefore the permit application fee is \$5,000. The fee was received by the Department on July 2, 2010. Please find attached Receipt No. 572330.

Arlington Response: *No response required.*

12. **General Comments** - The Department understands that Arlington has existing Federal Energy Regulatory Commission (FERC or Commission) automatic authorization for storage testing and development of the subject facility in accordance with 18 CFR § 157.215 under "Subpart F - Interstate Pipeline Blanket Certificates and Authorization Under Section 7 of the Natural Gas Act for Certain Transactions and Abandonment." In its August 26, 2010 Order Issuing Certificate and Approving Abandonment (Docket Nos. CP 10-99-000 & CP10-100-000), FERC stated and affirmed "We also confirm that the Part 157, Subpart F blanket certificate issued at the same time, authorizes construction and operation of certain facilities and certain amendments and abandonments all as described in Part 157, Subpart F of the Commission's regulations." The Department further understands that prior to putting Gallery 2 into natural gas storage service, Arlington will file an abbreviated application with FERC requesting authorization to provide services to customers using Gallery 2 storage capacity. Concurrent with Arlington's submission to FERC, this office requests that it be provided a copy of Arlington's abbreviated application.

Arlington Response: *A copy of any application submitted to FERC will be provided to the Department.*

**List of Exhibits to Response to DEC November 6, 2012
Notice of Incomplete Application**

Arlington Storage Company, LLC

Seneca Lake Storage Facility – Gallery 2

Exhibit A	Revised Environmental Assessment Form
Exhibit B	Revised Brinefield Map Showing Galleries
Exhibit C	Revised Vertical Geologic Cross-Sections A-A' and B-B'
Exhibit D	Relabeled Geophysical Cross-Sections
Exhibit E	West to East Structural Cross-Section (showing Well Nos. 30, 45 and 31)
Exhibit F	Well Nos. 30A/31A Stratigraphic Cross-Section Showing Formations and Cored Interval
Exhibit G	Revised Reservoir Suitability Report
Exhibit H	Brief Description Table for Well No. 31A
Exhibit I	MSDS for Natural Gas
Exhibit J	Directional Survey Reports for Well Nos. 30A and 31A
Exhibit K	1981 Sonar for Well No. 30
Exhibit L	Revised Subsidence Monitoring Plan
Exhibit M	Revised Well Status and Condition Report
Exhibit N	Revised Storage Rights Affidavit, Storage Rights Tabulation and Map